

"Ray's Patent Self-acting Car-Coupling."

WELLAND, August 31st, 1871.

SIR—

The above name affords but an imperfect idea of the nature and object of this invention. The operation of the Coupling and Brake will be better understood by reference to the annexed engravings and descriptions:

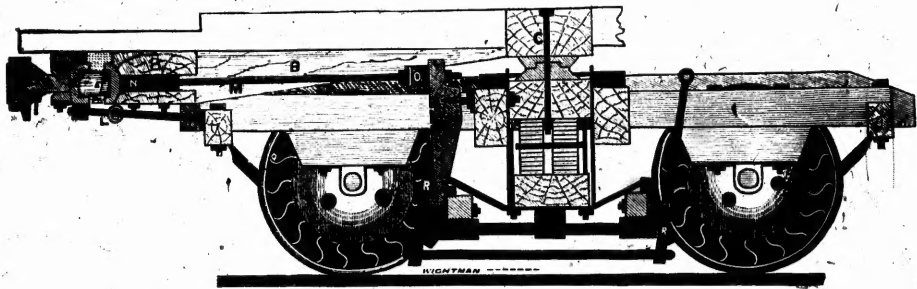


Fig. 1.

Fig. 1, is a cross section of Truck, Coupling, Self-acting Brake and part of Car Body.

Fig. 2, is a perpendicular view of parts of Two Cars coupled together, showing location of King-bolt and centre of Concentric Circles, and broken out so as to show Coupling and Brake Eulerum; and part of Buffer broken out to show Swiveled Screw and form of Coupling Box.

Fig. 3, is a front view of Freight Car and Coupling, showing its adaptability to Cars of different height.

Fig. 4, is a perspective view of Coupling, wrought-iron Draw Bars, (cast into Buffer Head) and Loosening Gear.

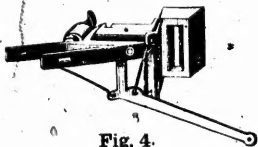


Fig. 4.

The Self-acting Brake (Fig. 1.) is adapted to passenger cars:—the operation of the same will be readily understood by reference to engravings. When the motion of the Train is retarded by the reversion of the Engine or from other causes, the momentum of the Train causes the Buffers to press against each other, forcing back the rod **M** and springs **O**, which lay against the buffer-key **N**, and forces back the governor **P**, which works on fulcrum **S**, as shown in Fig. 2 and brings the other end in contact with handle **R**, thus putting on brakes on those cars that have their fulcrums thrown forward; and it is not intended to supersede the hand brakes but to stand as a guard brake in case of accident or sudden emergency.

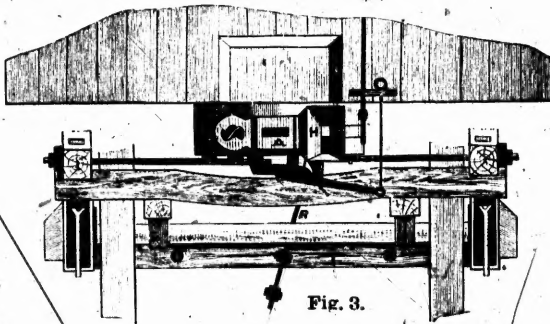


Fig. 3.

The Buffer Head **A**, is a solid casting in front of which are a perpendicular groove and projection fitting a corresponding groove and projection in opposite Buffer. The Buffer has a lateral motion between the parts of frame-work **B** (which is securely attached to the Car body) and is composed of parallel arcs, said arcs being portions of concentric circles whose common centre is not at the king-bolt **C**, but at the point **D**, in the line between king-bolt **C** and centre of Buffer Head **A**. The length of radius varies in proportion to the distance between the king-bolt on any Car, and is so determined that the front surface of buffer head shall always be at right angles with the track.

The following are a few of the most important
observations of the day, -

1. That a horse can run with a large
amount of load (viz. 1500 lbs) with
little fatigue, provided it is not
of the class in the saddle with a collection
to make it go as a light hack
course.
2. That a horse will go fast with
less motion.
3. That to break a horse is to break his
back, and to the position of the back
is the key to the whole matter.
4. That there can be made much shorter
by the use of the coupling, the coupling
being of the best of steel, and the
whole being of the best of steel.
5. That the horse will be much more
and more, as there will be
no cramping of the back, and
no cramping of the back.

will
y the
press
and
other
own
case

pro-
lateral
com-
not at
and A.
and is
track

straight
the front
screw **G**
a box **H**
together
opposite
made for
is thus

motion
or engi

a line of
Butler
the Tr
in cou
track.
the tra
motion
prop
ward
car be
frame
tric c
guide
turn
truck
by co



straight or curved. Between the parallel arcs are Buffer Springs **E** and Spring Plates **K**. Through the front of Buffer Head, on one side, is an oval aperture **F**, receiving the circular shank of swiveled screw **G**, (the aperture is made oval to allow of perpendicular vibration) and on the opposite side is a box **H** with expanding sides, to receive (in coupling) the opposite screw. When two cars are run together, the projection and groove in one Buffer Head fit the corresponding projection and groove in opposite Buffer. The screws pass through their respective boxes. The shoulders of screws are made to stand at right angles, behind the boxes, by inertia or weight of lever **I**, and a double coupling is thus effected. The two screws act in unison and one cannot couple without the other.

Cars are uncoupled by means of the lever **I**, (Fig. 4) which acts on both Screws by a single motion and may be placed in any convenient position—as the top or side of Car, or on the platform or engine; and is equally effective when the cars are at rest, in motion, or under strain.

The Buffers **A**, held firmly together by the Screws **G**, are immovable as to each other, and a line drawn from centre to centre of concentric circles **D** on opposite Cars passes through centre of Buffer Heads. The movable Spring Plates **K**, between parallel arcs **B**, are attached by braces **L** to the Trucks, hence the Buffers, when the Cars are in motion, control the motion of the Trucks, and, in coupling, the Trucks control the motion of the Buffers, always keeping them in the centre of the track. The whole Train is as one long car which accommodates itself to the degrees of curvature in track. The Buffers govern lateral motion, and to some extent overcome irregularity of vertical motion. In turning curves, the projections of the car bodies over the bolsters, are carried out of line in proportion to the degree of curvature in the track; and, as the centres of concentric circles are forward of the king-bolt, they are carried from the centre of the track towards the long rail, and as the car body or bodies are moving in or out of line, the Buffer or Buffers turn the draw frame (or car body) as the case may require, keeping in the straight line of draught from centre to centre of concentric circles on opposite Cars, which keep the Buffers in the centre of track, and the Trucks being guided and controlled by the Buffers, maintain an angle equal to the curve in the track without being turned by the lateral pressure of the wheels against the long rail. Hence the manner of relieving trucks and track from lateral strain, and removing the danger of being run off the rails, are obtained by controlling the swivel of the trucks in the manner shown and described.

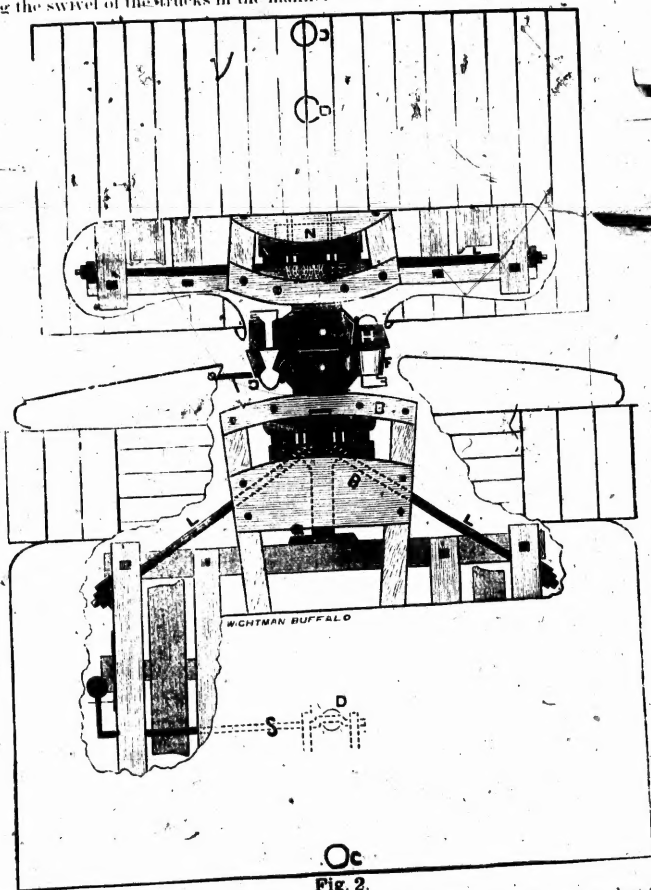


Fig. 2.

I might refer to many advantages over the present system of uniting cars; but from the engravings and description herein given, men engaged in this branch of enterprise will be able to discern such advantages; and being confident that *Safety, Speed, Comfort and Durability* will be much increased by this appliance, let me ask your earnest attention to this invention, which I believe is destined to supply a desideratum in Railroad enterprise.

Respectfully Yours,

THOMAS RAY,
Welland, Ontario.